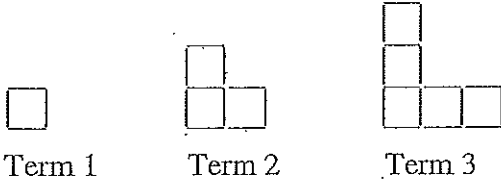


### 3.3 Toothpick Sequences 2

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Look at this sequence of toothpick figures.



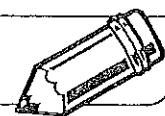
1. Complete the table.

Term	Toothpicks
1	
2	
3	
4	
5	

2. Write a rule that connects the number of toothpicks to the term number.

3. How many toothpicks are in:

- a. Term 6?
- b. Term 7?
- c. Term 100?

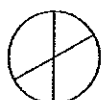
**LESSON**  
**3•3**
**“What’s My Rule?” for Geometric Patterns**


1. When you cut a circular pizza, each cut goes through the center.

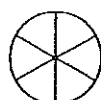
Cuts	Pieces
1	2
2	4
3	
4	
	12
	16



1 cut



2 cuts



3 cuts

Fill in the missing numbers in the table. Then write an algebraic expression that describes how many pieces you have when you make  $c$  cuts.

\_\_\_\_\_ pieces

2. Fold a sheet of paper in half. Now fold it in half again. And again. And again, until you can't make another fold.

After each fold, count the number of rectangles into which the paper has been divided. Fill in the missing numbers in the table. Write an algebraic expression to name the number of rectangles you have after you have folded the paper  $k$  times.

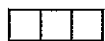
\_\_\_\_\_ rectangles

Folds	Rectangles
0	1
1	2
2	
3	
4	
5	
6	

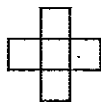
3. Below are the first 4 designs in a pattern made with square blocks. Draw Design 5 in this pattern.



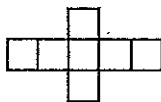
Design 1



Design 2



Design 3



Design 4

Design 5

4. How many square blocks will there be in

a. Design 10? \_\_\_\_\_

b. Design  $n$ ? \_\_\_\_\_